



منظمة الأغذية  
والزراعة  
للأمم المتحدة

联合国  
粮食及  
农业组织

Food  
and  
Agriculture  
Organization  
of  
the  
United  
Nations

Organisation  
des  
Nations  
Unies  
pour  
l'alimentation  
et  
l'agriculture

Organización  
de las  
Naciones  
Unidas  
para la  
Agricultura  
y la  
Alimentación

## Executive Summary

The Food and Agriculture Organization (FAO) hosted an Expert Consultation on "Genetically Modified Organisms in Crop Production and Their Effects on the Environment: Methodologies for Monitoring and the Way Ahead" from 18 to 20 January, 2005 in Rome. The main objective of the consultation was to review the scientific basis for, and procedures to establish, effective post-release monitoring of genetically modified (GM) crops and develop guidelines to strengthen member countries' capacities to design and carry out monitoring programmes. The participants represented a wide range of expertise from research institutes, universities, international agencies, regulatory agencies, the private sector and civil society. The consultation was jointly organized by the Plant Production and Protection Division of FAO's Agriculture Department and the Inter-Departmental Working Groups on Biodiversity for Food and Agriculture and on Biotechnology in Food and Agriculture.

The experts emphasised that GM crop deployment must comprise the whole technology development process, from pre-release risk assessment to biosafety considerations and monitoring post release. The positive and negative effects of GM crops on the environment are shaped by location and context, and monitoring programmes should recognize that there are important sources of variation within and among farming systems. It should inform decision making and provide feed back to the regulatory process and policies that support the development of sustainable practices. Wherever possible, the objectives of monitoring programmes should, therefore, be nested within processes that address broader goals.

The experts did not list or evaluate individual indicators needed for monitoring, but emphasized the critical importance of planning the process. Major outputs of the meeting were:

- i) A review of scientific criteria and procedures that address the technical aspects of monitoring environmental effects of GM crops;
- ii) Two strategies that could be used as the basis of efficient monitoring programmes and,
- iii) Recommendations for scientists managing the monitoring process, policy and decision makers, FAO and other relevant international agencies.

The capacity to undertake monitoring varies globally. Several developed countries have undertaken large-scale, long-term research and post-release monitoring programmes for GM crops that have provided an effective basis for decision making. Monitoring programme development is, however, a greater challenge in the developing world, where possible hazards are less clearly understood and the stakeholders are less well defined. In addition, opportunities for engagement in public debate are limited, environmental protection measures are less effectively enforced, and there are insufficient resources for research and development or for strengthening local expertise.

To address these challenges, experts have developed a robust design for monitoring that could work within limited resource levels, using the example of herbicide-tolerant rice in Asia with the potential risk of gene flow to weedy rice. The core values of the monitoring programme are the serious commitment to engage and consult with people with a stake in the final outcome, and a judicious selection of indicators that meet the basic requirements for scientific rigour and address stakeholder concerns, and can trigger appropriate management or regulatory responses.

The key steps or actions for developing a monitoring programme are as follows:

- **Set monitoring programme goals and immediate objectives**

- Consult stakeholders, including farmers and managers, regarding the natural resources to develop the goals and immediate objective.
- **Identify potential barriers**
  - Prioritize and develop plans to overcome or minimize potential field barriers or otherwise.
- **Identify potential risks and benefits**
  - Use stakeholder and expert knowledge of potential risks/concerns and benefits of GM crops, and ways and indicators to measure these factors.
- **Develop a testing hypothesis to guide actions and decisions**
  - Ensure that the hypothesis is simple, robust and can be easily tested in the field.
- **Identify a limited number of potential indicators**
  - Ensure that the indicators meet the basic requirements of scientific rigor;
  - Reflect key elements of the hypothesis tested;
  - Compare with control sites and/or baseline values prior to GM crop release; and
  - Estimate the status and trends in indicator values.
- **Determine appropriate trigger values for decision making and action**
  - Anticipate the range of decisions and actions if triggers are exceeded; and
  - Prepare a follow-up action plan.
- **Cultivate a transparent and effective process**
  - Ensure follow-through continued involvement of stakeholder;
  - Maintain clarity in analysis and reporting, and identify needs; and
  - Build linkages with policy development and capacity building.

The consultation viewed these actions as occupying a toolbox. They should not be adopted as an inflexible, linear process. Full stakeholder engagement should be fostered through formal and informal networks, alliances and initiatives to promote resource mobilization, communication and information dissemination. Building trust and transparency is the only way to sustain an effective link between monitoring and the resulting actions.